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Corporate Capital Structure and Its Market Value in Nigeria

Following the Modigliani–Miller paradigm (1958), corporate financing decision preference has attracted the attention of most scholars of corporate finance in the past decade. This method of approach has stimulated substantial research efforts in determining what seems to be an optimal capital structure for firms as it affects corporate market value within the corporate cycle.

The aim of this study is to facilitate an optimal capital structure for firms because empirical evidences have shown that a firm's capital structure is fundamental in determining its going concern in times of economic instability and financial distresses. It is also a contribution to the literature by providing empirical evidence within the context of the Modigliani – Miller relevance theory and the static-order theory and to the author's knowledge, there are only a few works in Nigeria devoted to the study of the Nigerian corporate capital and their influence on the market values, and still with no consensus consideration.

The effect of a firm's capital structure on its market value was considered empirically in this paper. Dataset for analysis was used from non-financial listed companies for the period of 2005-2009. A significant and positive relationship between non-financial firms' market values and their debt-equity ratios were obtained from the regression analysis. The negative relationship between a firm's total-debt/total-capital ratio and its market value, its size positively affect and its market value were obtained. The firms' leverage of positive influences on their market values was found. It is suggested that a firm should actually attain an optimal capital structure.

Keywords: capital structure, market value, non-financial firms, static order theory, firm size.

Introduction. Following the Modigliani–Miller paradigm in 1958, corporate financing decision preference has attracted the attention of most scholars of corporate finance in the past decades which has stimulated substantial research efforts in determining what seems to be an optimal capital structure for firms as it affects corporate market value within the corporate cycle. Major debates have centred on the existence of an optimal capital structure and the level of debt usage relevant to individual firm's capital structure. According to Modigliani and Miller (1958), under the perfect capital market assumption, a firm's market value does not depend on its choice of capital structure when there are no bankruptcy costs, taxes, and capital markets are frictionless. But after due consideration on the inclusion of corporate taxes, Modigliani and Miller (1963) assented, by way of amending their previous proposition, that when there are corporate taxes then interest payments are tax deductible and that 100 percent debt financing is optimal. That is, corporate value increases as debts increases. Considering this argument, despite the substantial research efforts devoted to determining an optimal capital structure for individual firms, there is still no generally accepted theory throughout the literatures explaining the debt-equity choice of firms Adeyemi and Oboh, (2011). In Nigeria, one of the fundamental causes of corporate distress points to the fact that inadequate capital and inappropriate capital mix characterize the Nigeria firms (Salawu, 2007). Generally, firms are faced with a complex list of options when deciding on their choice of capital structure. Most firms have to choose either to finance their investments with retained earnings, new equity issues, or through debt.

The aim of this study is to facilitate an optimal capital structure for firms because empirical evidences have shown that a firm's capital structure is fundamental in determining its going concern in times of economic instability and financial distresses. It also adds to the literature by providing empirical evidence within the context of the Modigliani-Miller relevance theory and the static-order theory the effects of a firm's choice of debt-equity mix on its market value drawing evidence from Nigeria. To the best of our knowledge, there are only few studies in Nigeria that have examined the Nigerian corporate capital structure as it affects market values, and still with no consensus consideration.

SCOPE. The first part of this paper introduces the title and aims of the study while the second part reviews the related literature, the third part is on methods used. The result of discussion and conclusion of the study follows in the fourth and fifth parts respectively.

Literature Review and Theoretical Framework. Although there have been substantial research efforts made by different scholars in examining the factors affecting a firm's choice of capital structure, no generally accepted theory exists throughout the literatures explaining the firm's choice of debt-equity combination. But in the last decades, there are several theories propounded explaining a firm's capital structure and its determinants subsequent to the Modigliani–Miller (1958) [13] paradigm. Different scholars have expanded on their irrelevance theory of capital structure and several theories have emerged explaining the capital structure choice of a firm and the factors influencing such choice. For instance, the pecking-order theory, the static-order theory and the agency cost theory among others have been largely discussed in the literatures (Bokpin and Isshaq, 2008 [5]).

This theory, despite its success raised a number of considerable debates among researchers (Modigliani and Miller, 1963 [14]; Baxter, 1967 [4]; Warner, 1977 [19]; Miller, 1977 [12]; De Angelo and Masulis, 1980 [6]; Altman, 1984 [3]; Myers, 1984 [15]; Leland, 1994 [11]; Abu, 2008 [1]).

This paper, however, in the context of the Modigliani-Miller relevance theory and the static order theory of capital structure discusses how a firm's capital mix affects its market value. Normally firms finance their operations through various sources consisting of preferred shares and debts, variable and secure income securities. Therefore, corporate financing decision simply involves a firm combining various securities in order to minimize its risks and maximize expected returns. The essential argument here is how a firm should strike a balance between risk and return in order to attain optimum capital mix of debt and equity. A firm's capital structure could either be all equity financed (i.e. 100% equity capital), or all debt financed (i.e. 100% debt capital), or could be an appropriate mix of both equity capital and debt capital (i.e. X% equity capital and Y% debt capital).

Data and Methodology. In this study, empirical model and estimation method are used based on effect of firm's capital structure, on its market value using a multiple regression estimator framework. Dataset were obtained from the annual reports and accounts of a selection of listed non-financial companies for the period of 2005 to 2009. Periodical publications of the Nigerian Stock Exchange such as fact books were also depended upon to augment available data. Seeing that some of the variables in this study are proxies for the real variables, it is imperative at this point to properly define the constructed variables. The regression model states:

$$Y_{it} = a_0 + b_1 X_{1it} + b_2 X_{2it} + b_3 X_{3it} + \varepsilon_{it} . \quad (1)$$

Where:

- Y_{it} = market price per share (being the dependent variable);
- X_{1it} = long-term debt/equity capital;
- X_{2it} = total-debt/total capital;
- X_{3it} = natural logarithm of net assets;
- a_0 = Intercept or constant of the equation;
- b_1, b_2, b_3 = as coefficients of the independent variables;
- and ε_{it} = error term.

The key variables of this study include the market value of the firms, their debt-equity mix (X_1) and total-debt/total capital ratio (X_2) for the specified financial period. According to most corporate finance literatures and theories of capital structure, the firms' debt ratios (DRs) are usually used as the measurement for the level of leverage employed by the firms. This largely depends on the purpose the study seeks to achieve. Prior empirical studies have employed a broad choice of debt ratios as measurement for financial leverage (see Hamson, 1992; Abu, 2008). For the purpose of this study, their debt-equity mix (X_1) and total-debt/total capital (X_2) were used to measure their debt ratios. The market price per share, in like prior studies, has been used in this study because most firms are generally valued being based on their market values in times of takeover or merger, and or, when a new issue is to be made. And also, most investors are likely to be attracted to firms with higher market price per share than those with lower market price per share. Furthermore, the size of the firms were included in the regression analysis as a control variable in order to bring the study to a logical conclusion. Different measurements for the firm's size were employed in most prior empirical studies. For instance, Hamson (1992) used the natural logarithm of the sum of the fair value of equity and the book value of liabilities, the natural logarithm of total-assets was employed by Gul and Tsui (1998) and the natural logarithm of sales was used by Titman and Wessels (1988). However, this study adopted the natural logarithm of net-assets as the measurement for the firms' size.

Empirical Results and Discussion. In this section, we examined the descriptive statistics for both the explanatory and dependent variables of interest. Each variable is examined based on the mean, standard deviation and normally distributed skewness and kurtosis values. A long right tail signifies a positive skewness and a long left tail signifies a negative skewness. A value of 3 has been suggested to be a normal kurtosis value. A variable with a value greater than 3 indicates a substantial peak. But when it is less than 3, then the distribution will be flatter. Table 1 below displays the descriptive statistics for the study.

Table 1

Descriptive statistics

Variables	Min	Max	Mean	Std. D	Skewness	Kurtosis	N
Dependent:							
Y_{it}	1.398	225.934	28.8053	48.8269	2.858	8.362	39
Independent:							
X_1	0.0009	1.9849	0.3866	0.4087	2.224	6.059	39
X_2	0.0009	10.1322	0.4653	1.5962	6.152	38.203	39
X_3	4.68	7.60	6.5174	0.7001	-0.629	0.137	39

Source: Developed by the author.

Note: This table presents descriptive statistics for all the variables of interest.

As shown in Table 1, the mean value for Y_{it} indicates that, on the average, most non-financial firms have a relatively fair market value (mean = 28.8053). That is, not too low and not too high, suggesting that only a few firms have their market values above average. The mean value for X_1 signifies that on the average, the debt/equity ratios of most firms are skewed towards equity capital than debt capital (mean = 0.3866). Implying that, most non-financial firms in Nigeria are low-g geared companies. Whereas the mean value for X_2 indicates that the total debt/total capital ratio of most of the firms is below average (mean = 0.4653), the mean value for X_3 indicates that most of the firms are large companies having their net assets above average (mean = 6.5174).

Furthermore, considering the Y_{it} variable, it shows a right tail distribution (skewness = 2.858), as well as a substantial peak value (kurtosis = 8.362). Also, the

X_1 and X_2 variables show right tail distributions as seen in Table 1 (skewness = 2.224 and 6.152 respectively) and substantial peak values (kurtosis = 6.059 and 38.203 respectively). Whereas, the X_3 variable has a left tail distribution and a low peak value (skewness = -0.629 and kurtosis = 0.137 respectively). From the descriptive statistics as a whole, the variables show right tailed distributions and substantial peak values, except for the X_3 variable which shows a left tail and low peak value. We therefore conclude that variables are skewed and have substantial kurtosis values.

As part of the procedure for analysis in this study, a correlation analysis was performed in order to establish relationship among all the variables of interest. Table 2 below displays the correlation matrix.

Table 2

Correlations Matrix

		Y_{it}	X_1	X_2	X_3
Y_{it}	Pearson Correlation	1			
	Sig. (2-tailed)				
X_1	Pearson Correlation	0.392(*)	1		
	Sig. (2-tailed)	0.014			
X_2	Pearson Correlation	-0.042	0.205	1	
	Sig. (2-tailed)	0.801	0.211		
X_3	Pearson Correlation	0.443(**)	0.252	-0.023	1
	Sig. (2-tailed)	0.005	0.122	0.889	

Source: Developed by the author.

Note: *Significant at 5% level (2-tailed),

** Significant at 1% level (2-tailed). $N = 39$.

An examination of Table 2 shows that the highest correlated variable of the Y_{it} is the X_3 variable, having a correlation coefficient of 0.443 and it is significant at a 0.005 level of significance ($P < 0.01$). While the next correlated variable to the Y_{it} variable is the X_1 with a correlation coefficient of 0.392 and significant at a 0.014 level of significance ($P < 0.05$), while X_2 has a negative correlation coefficient of -0.042 and not significant ($P = 0.801$). The analysis of the independent variables shows that there are no correlations among them, indicating that there is an absence of multicollinearity. With regards to the correlation analysis, we conclude that larger non-financial firms tend to have higher market values than smaller firms. Where as the capital-mix of long-term debt and equity capital has a positive influence on the firms' market value, their total debt (combination of long and short term debts) to total capital has a negative impact on their market value.

Regression Analysis. This study primarily examined the empirical effect a firm's debt-equity choice has on its value. In order to evaluate this effect, this study adopted the multiple regression estimation analysis, and the regression results of the model are given in Table 3 below.

The results from the multiple regression analysis reported the F-statistic to be 4.753 and being statistically significant at a 0.007 level ($P < 0.05$). The R^2 and adjusted R^2 values are indicated as 0.289 and 0.229 respectively. The Adj- R^2 value shows that the estimated model is able to explain about 23% of the variations in firm value. While the Durbin-Watson test shows a value of 2.040. Examining the regression coefficients of the model, X_1 has a coefficient value of 38.435 and is positively significant at 0.040 level ($P < 0.05$), X_2 has a negative coefficient of -3.040 and is not statistically significant ($P = 0.508$), while X_3 has a coefficient of 25.072 and a significant value of 0.020 level

(i.e. $P < 0.05$). Based on the regression analysis as shown in Table 3, we conclude that a positive and significant relationship exists between a firm's market value and its debt-equity choice and size. In conformity with the M&M and static-order theoretical standpoints, Table 3 plainly demonstrates that a firm's market value increases as a result of the increase in its financial leverage since the expected coefficient for X_1 is positive. However, the level of its total-debt to total capital ratio should be adequately managed so as to minimize debt associated risk. The estimate for the X_3 simply suggests that bigger companies have higher market value for every unit of investment. Hence, supporting the argument for investment diversification and economies of scale in leverage related costs (Abu, 2008).

Table 3

Regression Analysis Results

Predictors' Variables	Constant	X_1	X_2	X_3
Dependent Variable	0.032	0.040	0.501	0.020
Y_{it}	(-148.047) ^a	(38.435) ^a	(-3.040) ^a	(25.072) ^a
	-2.238**	2.133**	-0.681	2.434**

Source: Developed by the author.

Note: **Significant at 5% level and coefficients are in parenthesis.

Furthermore, in order to find out the autocorrelation in the residuals in the regression, the Durbin–Watson (DW) value of model was computed. The result shows the value of 2.040, implying that the independence of residuals assumption is not violated. This conclusion is based on the suggestion of Kohler (1994), stating that the Durbin–Watson values have an upper limit of 4 and lower limit of zero. So, if the Durbin–Watson value is equal to 2, then there exists no autocorrelation, but if the value is less than or greater than 2, then there exists a positive correlation or negative correlation respectively. Also, it was observed from the analyses, that most non-financial firms in Nigeria scarcely made use of debt capital in their capital structure, thereby making their capital structure lopsided, i.e. more equity capital to debt. It was also observed that the firms' debt structure is mostly dominated by short-term debts. One of the reasons identified for the inappropriate capital mix is due to the lack of theoretical background on the part of the financial managers.

Conclusion. After the seminal Modigliani–Miller paradigm on the theory of capital structure and the effects on market value in 1958, major debates have centred on the existence of an optimal capital structure and the level of debt usage relevant to individual firm's capital structure. Therefore, for this discrepancy in theory that this study attempted to empirically investigate how a firm's choice of capital structure affects its market valuation, basing its argument on the Modigliani-Miller relevance theory and the static-order theory of capital structure. Consistent with prior empirical studies, we conclude that a firm's leverage choice affects its market value positively and significantly. Suggesting that, a firm can actually attain an optimal capital structure, where its risk will be minimized and returns maximized. This is in support of the research findings of Modigliani and Miller (1963) and Abu (2008) among others, but in sharp contrast to the pecking order theory as propounded by Donaldson (1961), which assumes a firm's capital structure as irrelevant to its market value and that a firm's choice of capital structure should follow a well-defined order.

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Корпоративна структура капіталу та його ринкова вартість у Нігерії

Емпірично досліджено вплив структури капіталу фірми на її ринкову вартість. Для аналізу використано дані про нефінансові компанії, включені до біржового лістингу, за 2005–2009 рр. Результати регресійного аналізу показують значний позитивний зв'язок між ринковою вартістю нефінансових фірм та відношенням їх заборгованості до їх власного капіталу. Але оскільки існує негативний зв'язок між відношенням сукупного боргу до сукупного капіталу фірми та її ринковою вартістю, його розмір позитивно впливає на її ринкову вартість. Можна підсумувати, що леверидж фірми позитивно впливає на її ринкову вартість. Припускається, що насправді фірма може досягти оптимальної структури капіталу.

Ключові слова: структура капіталу, ринкова вартість, нефінансові фірми, статична теорія порядку, розмір фірми.

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Корпоративная структура капитала и его рыночная стоимость в Нигерии

Эмпирически исследовано влияние структуры капитала фирмы на ее рыночную стоимость. Анализ выполнен на данных о нефинансовых фирмах, включенных в биржевой листинг, за 2005–2009 гг. Результаты регрессионного анализа показывают значительную положительную связь между рыночной стоимостью нефинансовых фирм и отношением задолженности к собственному капиталу. Но поскольку существует отрицательная связь между отношением совокупного долга к совокупному капиталу фирмы и ее рыночной стоимостью, его размер положительно влияет на рыночную стоимость. Таким образом, можно заключить, что леверидж фирмы положительно влияет на ее рыночную стоимость. Предполагается, что на самом деле фирма может достичь оптимальной структуры капитала.

Ключевые слова: структура капитала, рыночная стоимость, нефинансовые фирмы, статическая теория порядка, размер фирмы.

